

maximum utilization of the Shuttle capacity for primary and secondary payloads that require transportation to or from orbit by the Space Shuttle.

(3) All Shuttle flights will be planned with a minimum NASA crew of five astronauts (commander, pilot, and three mission specialists). When payload or other mission requirements define a need and operational constraints permit, the crew size can be increased to a maximum of seven. Any such additional crew members must be identified at least 12 months before flight and be available for crew integration at 6 months.

(4) NASA policy and terminology are revised to recognize two categories of persons other than NASA astronauts, each of which requires separate policy treatment. They are:

(i) *Payload specialists*, redefined to refer to persons other than NASA astronauts (commanders, pilots, and mission specialists), whose presence is required onboard the Space Shuttle to perform specialized functions with respect to operation of one or more payloads or other essential mission activities.

(ii) *Space flight participants*, defined to refer to persons whose presence onboard the Space Shuttle is *not* required for operation of payloads or for other essential mission activities, but is determined by the Administrator of NASA to contribute to other approved NASA objectives or to be in the national interest.

(b) *Payload specialists*. Payload specialists may be added to Shuttle crews when more than the minimum crew size of five is needed and unique requirements are involved. In the case of foreign-sponsored missions and payloads, the need and requirements for payload specialists will be negotiated and mutually agreed between the foreign sponsors and NASA. The selection process for additional crew members to meet approved requirements will first give consideration to qualified NASA mission specialists. When payload specialists are required, they will be nominated by the appropriate NASA, foreign, or other designated payload sponsor. In the case of NASA or NASA-related payloads, the nominations will be based on the recommendations of the

appropriate Investigator Working Group (IWG).

(c) *Space flight participants*. NASA remains committed to the long-term goal of providing space flight opportunities for persons outside the professional categories of NASA astronauts and payload specialists when this contributes to approved NASA objectives or is determined to be in the national interest. However, NASA is devoting its attention to proving the Shuttle system's capability for safe, reliable operation and to reducing the backlog of high priority missions. Accordingly, flight opportunities for space flight participants are not available at this time. NASA will assess Shuttle operations and mission and payload requirements on an annual basis to determine when it can begin to allocate and assign space flight opportunities for future space flight participants, consistent with safety and mission considerations. When NASA determines that a flight opportunity is available for a space flight participant, first priority will be given to a "teacher in space," in fulfillment of space education plans.

§ 1214.304 Process.

(a) *Determining the need for additional crew members*. The payload sponsor will be responsible for recommending the number of additional crew members and for establishing the technical or scientific need, the selection criteria, uniqueness of qualifications, the proposed training, and other requirements for the additional crew members. The payload sponsor's requirements for additional crew members, their qualifications, and the proposed duration for training will be reviewed with and concurred in by the Associate Administrator for Space Flight.

(b) *Selection of additional crew members for NASA and NASA-related payloads*. After the requirement for additional crew members has been established, the IWG will be tasked by the payload sponsor to commence the selection process. The IWG review process will include the participation of a senior astronaut from the Flight Crew Operations Directorate at the Johnson

Space Center who will provide operational and applicant suitability criteria.

(1) Prior to the payload sponsor's recommendation for additional crew members and at his/her direction, the IWG will have studied the requirements of the selected investigations, the number, qualifications, training requirements and other requirements of payload specialists, and backups necessary to support the payload objectives, and made recommendations to the payload sponsor.

(2) Members of the mission specialist cadre will be considered first. The payload mission manager, on behalf of the IWG, will convey the selection criteria for the proposed additional crew members to the Chief, Astronaut Office. The IWG, the mission manager, and the Astronaut Office will coordinate the review of the proposed candidates and the mission manager will forward recommendations to the payload sponsor. Recommendations from the payload sponsor will be submitted to the Associate Administrator for Space Flight for approval.

(3) If mission specialists meeting the requirements cannot be provided because of the uniqueness of requirements or impracticability of the resultant training obligation, or if backup payload specialists are required, the IWG may then solicit candidate payload specialists from outside the career astronaut corps. The solicitation will require, as a minimum, that a summary of professional qualifications be submitted to the IWG. In addition, a medical history, and the results of the physical examination described in paragraph (b)(3)(iii) of this section will be required. The IWG will be responsible for:

(i) Establishing professional and operational criteria for payload specialists for specific payloads. The criteria will include willingness on the part of the candidate to accept the applicable provisions of §1214.306 and satisfactory completion of a background investigation conducted to NASA's standards, as determined by the Director, NASA Security Office.

(ii) Evaluating all candidates using the criteria established.

(iii) Determining which candidate payload specialists, who meet the NASA Class III Space Flight Medical Selection Standards, are deemed best professionally qualified. (The preselection phases of the medical examination will be conducted at Johnson Space Center by certified examiners approved by the Director, Life Sciences Division, NASA Headquarters).

(iv) Submitting its recommendations for payload specialists through the mission manager to the payload sponsor who in turn will determine final recommendations which will be reviewed with and concurred in by the Associate Administrator for Space Flight.

(4) The payload sponsor and the Associate Administrator for Space Flight will advise the Administrator of the payload specialist selections.

(c) *Selection of additional crew members for foreign payloads.* The need and requirements for payload specialists will be negotiated and mutually agreed to between the foreign sponsor and NASA. This negotiating process will include the participation of a senior astronaut from the Flight Crew Operations Directorate at the Johnson Space Center who will provide operational and applicant suitability criteria. After agreement is reached, the payload sponsor will initiate the selection process. Subject to the negotiated agreement, subsequent steps in the process will be similar to those described in §1214.304(b) modified as follows:

(1) The IWG functions will be performed by a selection committee or other procedure designated by the payload sponsor.

(2) The payload sponsor will designate an individual to perform the mission manager functions.

(3) The committee or procedure in paragraph (c)(1) of this section and the person named in paragraph (c)(2) of this section will be established during the negotiations between the foreign sponsor and NASA, consistent with the specific circumstances.

(4) The payload sponsor will also be responsible for submission to NASA by an appropriate authority of written assurance that an inquiry has been made

into the recommended payload specialist's background and suitability on the basis of standards similar to those applied to NASA payload specialist candidates and a statement by the selected candidate asserting a willingness to accept the applicable provisions of § 1214.306. These written assurances must be received and accepted by NASA before selection and before any NASA training can begin.

(d) *Selection of additional crew members for other payloads.* After the request for additional crew members is approved, the payload sponsor will commence the selection process. The payload sponsor review process will include the participation of a senior astronaut from the Flight Crew Operations Directorate at the Johnson Space Center who will provide operational and applicant suitability criteria.

(1) The payload sponsor will first consider members of the mission specialist cadre. A representative of the payload sponsor selection committee will convey the selection criteria for the proposed payload specialists to the Chief, Astronaut Office, and coordinate on the recommendations for mission specialists to satisfy the requirements. The recommendations will be submitted to the Associate Administrator for Space Flight for approval who will then advise the Administrator of the selections.

(2) If mission specialists meeting the requirements cannot be provided because of the uniqueness of qualifications or impracticability of the resultant training obligation, the payload sponsor selection committee, with concurrence from the payload sponsor and the Associate Administrator for Space Flight, may then consider other candidate payload specialists. The payload sponsor will be responsible for:

(i) Establishing professional and operational criteria for payload specialists for specific payloads. The criteria will include willingness on the part of the candidate to accept the applicable provisions of § 1214.306 and satisfactory completion of a background investigation conducted to NASA's standards, as determined by the Director, NASA Security Office.

(ii) Evaluating all candidates using the criteria established.

(iii) Determining which candidate payload specialists, who meet the NASA Class III Space Flight Medical Selection Standards, are deemed best professionally qualified. (The preselection phases of the medical examination will be conducted at the Johnson Space Center by certified examiners approved by the Director, Life Sciences Division, NASA Headquarters).

(iv) Submitting its recommendations for payload specialist selection to the Associate Administrator for Space Flight for approval.

(e) *Preflight activities for additional crew members.* Mission specialists serving as additional crew for the payload, once selected, will be primarily responsible to the mission manager who, together with the IWG (or comparable body designated by the payload sponsor) and the Director, Flight Crew Operations, will determine the integrated training and work schedules as appropriate to the areas of responsibilities outlined in the following paragraphs.

(1) The IWG for NASA and NASA-related payloads or the Payload Sponsor for all other payloads is responsible for defining the training necessary for payload elements within its cognizance. The mission manager is responsible for the total integrated payload training and will assist the IWG as necessary in carrying out the defined training activities.

(2) The Director, Flight Crew Operations, is responsible for establishing the training requirements for payload specialists on Orbiter, Spacelab, and STS-provided payload support systems as appropriate. In order to enhance the crew integration process, the additional crew members (payload specialists and additional mission specialists) will be based at the Johnson Space Center 6 months prior to flight, unless otherwise agreed between the payload sponsor and the Director, Flight Crew Operations, Johnson Space Center.

(3) The payload specialists must be certified for flight by the Director, Flight Crew Operations, upon satisfactory completion of all required training and demonstrated performance of assigned tasks. Certification of the payload specialist's readiness for flight will be made to the payload mission

manager and will include an assessment by the crew commander of the payload specialist's suitability for space flight.

(4) The mission manager is responsible for verifying to the payload sponsor that all crew members are properly trained for in-flight payload operations.

(i) The medical program for payload specialists will be continued during the preflight period in accordance with the NASA Class III Space Flight Medical Selection Standards.

(ii) If, during the preflight period, the number of additional crew members is reduced to fewer than that agreed to, or an additional crew member does not meet the certification requirements, the necessary reprocessing may be initiated to provide replacements consistent with the above described selection process and the STS training requirements.

(f) *Designation of primary and backup payload specialists (when required).* At an appropriate time designated by the mission manager (not later than 9 months prior to flight), the IWG for NASA and NASA-related payloads or payload sponsor for all other payloads will recommend which payload specialists should be designated as prime and which as backup. However, in cases where mission specialists have been selected for the payload specialist position(s), they will be considered as primary at the time of selection. The recommendations will be forwarded by the mission manager to the Program Office which will review the recommendations and forward them to the Associate Administrator for Space Flight for concurrence. The payload sponsor and the Associate Administrator for Space Flight will advise the Administrator of the selections.

(g) *Effective date.* The described selection process will apply to all STS missions for which selections have not been approved prior to December 31, 1988.

§ 1214.305 Payload specialist responsibilities.

(a) *Relationship with flight crew.* The crew commander has overall responsibility for crew integration and the safe and successful conduct of the mission.

With respect to crew and vehicle safety, the commander has ultimate responsibility and authority for all assigned crew duties. The payload specialist is responsible to the authority of the commander and operates in compliance with mission rules and Payload Operation Control Center directives. Payload specialists are expected to operate as an integral part of the crew and will participate in crew activities as specified by the crew commander.

(b) *Operation of payload elements.* The payload specialist will be responsible for the operation of the assigned payload elements. Onboard decisions concerning assigned payload operations will be made by the payload specialist. A payload specialist may be designated to resolve conflicts between the payload elements and approve such deviation from the flight plan as may arise from equipment failures or STS factors. In the instance of STS factors, the mission specialist will present the available options for the payload-related decisions by the payload specialist.

(c) *Operation of STS equipment.* The payload specialist will be responsible for knowing how to operate certain Orbiter systems, such as hatches, food, and hygiene systems, and for proficiency in those normal and emergency procedures which are required for safe crew operations, including emergency egress and bail out. The responsibility for on-orbit management of Orbiter systems and attached payload support systems and for extravehicular activity and payload manipulation with the Remote Manipulator System will rest with the NASA flight crew. The NASA flight crew will operate Orbiter systems and standard payload support systems, such as Spacelab and Internal Upper Stage systems. With approval of the commander, payload specialists may operate payload support systems which have an extensive interface with the payload.

§ 1214.306 Payload specialist relationship with sponsoring institutions.

Specialists who are not U.S. Government employees must enter into a contractual or other arrangement establishing an obligatory relationship with